

Grand Avenue Northwest Corridor Study

WORKING PAPER NO. 1 RELATED STUDIES AND PLANS

April 12, 2001

Prepared for



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INTRODUCTION

Grand Avenue has been the subject of many transportation studies over the past 15 years. In 1985, a series of studies was conducted on developing a freeway concept for Grand Avenue to be included as part of the MAG Regional Freeway Plan. Between 1987 and 1989, these plans were reevaluated in additional studies that proposed a viaduct concept for Grand Avenue, but then recommended the freeway concept that was originally developed. Other studies and plans evaluated and designed interim improvements (until a freeway could be constructed) along Grand Avenue and a new bridge across the Agua Fria River.

In 1994, Grand Avenue was removed from the MAG Regional Freeway Plan due to lack of funds for construction. Potential surplus funding sources have renewed interest in upgrading Grand Avenue, and led first to the 1998 MAG Grand Avenue Corridor Study and then to this Grand Avenue Northwest Corridor Study from Loop 101 to Loop 303.

The purpose of this working paper on Related Studies and Plans is to provide a general summary of the studies and plans that were reviewed for this study. Studies and plans reviewed include previous Grand Avenue studies, regional multimodal studies, intelligent transportation system plans, and land use plans.

1.0 PREVIOUS GRAND AVENUE STUDIES

Twenty-nine documents on Grand Avenue were reviewed to obtain background information for this corridor study. The documents include design concept reports, right-of-way inventories, drainage studies, geometric alignment studies, transportation management improvement studies, and corridor studies. A listing of the reviewed documents and a brief summary of each report's contents are provided below.

West Area Transportation Analysis, Parsons Brinckerhoff Quade & Douglas, Inc., June 1985.

The report included an analysis of Grand Avenue and recommended either building a freeway along the corridor or building more grade separations, such as the one completed at Indian School Road by the City of Phoenix in the late 1970s.

Grand Avenue Corridor Study, Final Report (with executive summary), Parsons Brinckerhoff Quade & Douglas, Inc., September 1986.

The report evaluated and analyzed several alternatives for the corridor and recommended replacing Grand Avenue with an access-controlled expressway from Beardsley Canal to I-10. The cost of completing the expressway would be approximately \$600 million. The study incorporated material from several companion documents.

Grand Avenue Corridor Study, Environmental Assessment, Parsons Brinckerhoff Quade & Douglas, Inc., July 1986.

The report presented an assessment of the environmental impacts to the study area for each transportation improvement alternative evaluated in the *Grand Avenue Corridor Study*. Significant environmental impacts were identified for both the high level and low level expressway concepts. These impacts include:

- Increase noise levels or vibration for adjoining areas, resulting in exceedance of federal, state or local noise criteria (high level expressway).
- Affect existing housing, requiring the acquisition of residential properties and displacement of people (high level expressway).
- Affect property values or the local tax base (high level expressway).
- Result in the use of publicly-owned land from a park or recreation area (high level expressway).
- Generate additional traffic (high or low level expressway).

The report recommended that a full environmental impact statement be prepared if federal funds are used to construct the expressway. The above impacts may still be applicable, depending on the alignment and design of the facility.

Review of Grand Avenue Corridor Study, Tudor Engineering Company, September 1987.

The report reviewed the *Grand Avenue Corridor Study* and updated the study in accordance with newly expressed goals and policies of ADOT. The report concluded that the recommended high expressway alignment in the *Grand Avenue Corridor Study* did not meet design criteria, nor included the location of major design facilities. The report recommended that half of the expressway should be located southwest of the railroad tracks.

Grand Avenue Freeway Study, Concept Report, Tudor Engineering Company, December 1987.

The report presented a revised expressway concept for Grand Avenue. The concept separated regional through traffic from local traffic on an elevated viaduct. The report also recommended constructing a loop or bypass roadway that would route Grand Avenue traffic around and away from the six-leg intersections, to increase the capacities of the intersections and provide detour routes during construction. Another recommendation was to build one-half of the elevated structure and use three reversible lanes as a staged construction option.

Corridor Volume & Capacity Analysis – Grand Avenue, Tudor Engineering Company, September 1988.

The report summarized the volumes and capacities projected for Grand Avenue in the year 2010, assuming the PBQ&D freeway concept is constructed. Projections were obtained from the MAG transportation planning model. Daily traffic volumes on Grand Avenue were projected to reach 191,800 vehicles. Level of service analyses were also completed for the mainline and ramps.

Grand Viaduct Concept, Tudor Engineering Company, October 1988.

The report presented a viaduct concept for the Grand Avenue Expressway. The concept consisted of two parallel, three-lane bridge-like structures supported on piers for the length of Grand Avenue and would cost \$672 million to construct. The concept separated high speed through traffic from local traffic and maintained access to businesses.

Grand Avenue Viaduct Concept, Drainage Analysis, Tudor Engineering Company, February 1989.

The report recommended a method of providing protection from a 10-year storm for the viaduct concept and the reconstructed at-grade Grand Avenue. The study also provided a method of collecting off-site drainage, anticipated right-of-way requirements and estimated construction costs.

Parsons Brinckerhoff Quade & Douglas Freeway Concept, Right-of-Way Impacts & Cost Analysis, Tudor Engineering Company, February 1989.

The report with accompanying right-of-way plans identified a study level plan for right-of-way acquisition required for the construction of the PBQ&D Freeway Concept. Approximately 885 acres at a cost of \$400 million would be needed to construct the freeway.

Grand Freeway, Drainage Analysis, Tudor Engineering Company, May 1989.

The report addressed the drainage requirements for the proposed PBQ&D freeway concept. The report was based on data presented in *the Project Hydrology Report, Volume 1: Existing Conditions*. The report proposed on-site and off-site drainage plans. The estimated construction cost of these plans was \$68.6 million. Components of the plans included open channels, detention basins, storm drains, pass-through culverts, pumping stations, and large outfall pipes.

Grand Freeway, Concept Finalization Report, Tudor Engineering Company, August 1989.

The report reviewed and analyzed the high level freeway alignment recommended in the Grand Avenue Corridor Study. The alignment was revised to meet higher design parameters including a design year of 2010 and a design speed of 65 mph. Construction costs were estimated at \$775 million.

Grand Freeway, Right-of-Way Acquisition Data, Tudor Engineering Company, August 1989.

The report contained right-of-way data used to support the right-of-way acquisition costs for the Grand Avenue Freeway concept. The report provided a list of properties affected by the proposed right-of-way acquisitions.

Grand Freeway, Right-of-Way Impacts & Cost Analysis, Tudor Engineering Company, August 1989.

Right-of-way impacts associated with the Grand Avenue Freeway concept were documented in the report. A cost analysis and cost estimate were also included in the report. The Grand Avenue Freeway concept would require right-of-way acquisition of 854 acres at a cost of \$403 million.

Existing Right-of-Way Inventory Data, Tudor Engineering Company, August 1989.

The document includes an inventory of individual land parcels along Grand Avenue that are potentially affected by one or more of the alternatives for Grand Avenue. The inventory was incorporated into the TRANSPORT1 system and contained background information that could then be applied during right-of-way acquisition of the preferred alternative.

Grand Avenue, Existing Utility Summary, Tudor Engineering Company, August 1989.

The report provided an inventory of all utilities found within the Grand Avenue Corridor. The inventory listed the size, location, and ownership of each utility in the corridor. A mapping of the utility locations was presented in a separate appendix.

Railroad Relocation Evaluation of the Grand Avenue Corridor, Parsons Brinckerhoff Quade & Douglas, Inc., February 1988.

The study evaluated four major alternatives for relocating the railroad tracks running parallel to Grand Avenue. The recommended alignment is along the Dysart/El Mirage alignment. The realignment would remove 28 at-grade railroad crossings in the Grand Avenue Corridor. However, it would cost \$43 million more than would be saved in constructing the expressway due to the relocation of the railroad.

Grand Avenue Transportation System Management Study, Proposed Interim Improvements (with executive summary and appendices), Tudor Engineering Company, February 1989.

The report identified, evaluated, and recommended low-cost transportation system management improvements for Grand Avenue. Capacity improvements such as lane additions, movement restrictions, and traffic signal phasing changes were examined at each of the five- or six-legged intersections. Ten projects at a cost of \$5.7 million were recommended. Projects included standardization of intersection signage and layout, installing a signal master system and coordinating the signals on Grand Avenue, modification of left turns, and improving intersection geometry including improving turn radii. The appendices were bound in a separate report. These appendices contain a discussion on *Highway Capacity Manual* signalized intersection analysis, traffic counts taken at each intersection on Grand Avenue, and accident collision diagrams for each intersection.

Grand Avenue Task Force For Transportation System Management Improvements Project Manual and Meeting Minutes, Tudor Engineering Company.

The report is a collection of meeting notes from the Grand Avenue Task Force for Transportation System Management Improvements. Base information for the corridor is also included.

Grand Avenue Traffic Projection, Final Report (with appendices), Howard Needles Tannen & Bergendoff, June 1989.

The report produced a consistent set of 2010 traffic projections for four Grand Avenue design concepts. These design concepts were: arterial (no build), expressway, freeway and viaduct. The projections were obtained from the MAG regional urban travel demand models. The appendices contain traffic counts, technical memoranda, highway capacity analyses and traffic projections.

Agua Fria River Bridge, Alignment Study Report, Michael Baker Jr., Inc., June 1989.

The report analyzed three alignment alternatives for the Agua Fria River Bridge. These included the present design alignment, an alignment 28 feet north of the existing Grand Avenue centerline, and an alignment 18 feet south of the existing centerline. The recommended alternative is the alignment 28 feet north of the existing centerline. It was projected to cost \$8.3 million. A September 1989 addendum modified the recommended alternative. The modified alternative was 18 feet north of the existing Grand Avenue centerline and its estimated cost was \$7.8 million. The modified alternative provided ADOT with additional options for CalMat access, the railroad tracks, and drainage.

Thunderbird at Grand Avenue, Level of Service Analysis, Kimley-Horn & Associates, Inc., January 1990.

The report assessed the feasibility of a three-lane cross-section instead of a five-lane section for Thunderbird Road south of Grand Avenue. The report stated that a three-lane section for the northbound Thunderbird Road approach at Grand Avenue would be adequate, as the v/c ratio did not approach 1.0 in either peak hour using 2000 projected volumes.

Grand Avenue Widening, Beardsley Canal to Thunderbird Road, Cost Estimate and Calculations for Horizontal and Vertical Alignment, Kimley-Horn & Associates, Inc., January 1990.

The report provided a collection of the calculations used in estimating the cost to widen Grand Avenue between Beardsley Canal and Thunderbird Road. The total estimated cost was \$20 million.

Agua Fria River Bridge, Design Concept Report, Draft, Michael Baker Jr., Inc., March 1990.

The report re-evaluated the basic concept and design of the proposed Agua Fria River Bridge project because of an existing sanitary landfill and reduced design flows for the river. The report recommended realigning the bridge to maximize use of existing right-of-way, lower the main channel bridge and eliminate the overflow channel bridge. The bridge would likely need to be widened to three lanes in each direction, ten years after construction.

Agua Fria River Bridge Drainage Alternative Concepts and Recommendation, Michael Baker Jr., Inc., May 1991.

The report evaluated various drainage alternative concepts for drainage of Grand Avenue between Thunderbird Road and the Agua Fria River. The recommended alternative includes proving a double pipe storm sewer to convey drainage into the river. Off-site flows would flow across Grand Avenue via a small bridge or box culvert. The project was estimated to cost \$1.1 million.

Agua Fria River Bridge, Final Drainage Report, Michael Baker Jr., Inc., November 1991.

The report provided the hydrology and drainage concept for approximately one mile of associated roadway improvements to Grand Avenue. The report also defined assumptions and design conditions for the bridge related to drainage.

Agua Fria River Bridge, Final Design Analysis, Bruflat Engineering Company, August 1992.

The report proposed an alternative to the drainage concept of the Agua Fria River Bridge. The alternative included using precast concrete box culverts in place of 2-72" reinforced concrete pipes.

Final Design Concept Report, US 60, Morristown Railroad Overpass-Beardsley Road, Sverdrup Civil Inc. (for ADOT), June 1996.

This Final Location/Design Concept Report presents the results of an investigation of alternatives for improving US 60 between Morristown and Beardsley Road, just southeast of the Loop 303 intersection. The preferred alternative for this 15.4-mile segment of two-lane rural highway is a four-lane divided highway with a 60-foot median, using the existing roadway for westbound traffic.

Grand Avenue Corridor Study, Beardsley Canal to 7th Avenue/Van Buren, URS Greiner, May 1998.

This corridor study provided an examination of 14 options for the corridor and the further development and refinement of three of those options. Integration of transit into the corridor and the impact on development along the corridor were parts of the process. The results of the study indicated that there is considerable interest in pursuing major improvements to the Grand Avenue Corridor. There was no consensus on the best option for the corridor, however.

Specific options considered in the study included:

- A depressed expressway through Sun City, with frontage roads and ramps connecting to major cross streets.
- Grade separation for pedestrians and golf carts in Sun City.
- Improved lane continuity, signal timing and signal progression between the New and Agua Fria rivers.
- Diversion of traffic west of Sun City to Loop 303, Dysart Road, or a possible new north-south route from Bell Road to Olive Avenue near the Agua Fria River.

Grand Avenue Major Investment Study, URS Greiner Woodward Clyde, September 1999.

This ADOT-sponsored MIS developed and evaluated alternatives for solving transportation problems in the Grand Avenue Corridor from I-17 to Loop 101, with an emphasis on alleviating traffic congestion due to the six-leg intersections and Burlington Northern Santa Fe (BNSF) railroad activity. After careful consideration of factors such as existing infrastructure, current traffic conditions, traffic forecasts, socioeconomic characteristics, land uses and environmental concerns, the study concluded that the alternative known as Option 4 should be implemented as quickly as available funding permits. Option 4

eliminates the major six-leg intersections by constructing alternating grade separations; i.e., Grand Avenue is grade-separated at some intersections and one of the cross streets is separated at others. In addition, a new southbound off-ramp and northbound on-ramp will connect Grand with Loop 101 via 91st Avenue.

ADOT and MAG have programmed \$160 million to implement the recommended improvements by 2007. Between the eight grade-separated intersections (including the existing Indian School overpass), a limited number of signalized intersections will remain. However, the recommended improvements will allow Grand Avenue to be further upgraded to expressway standards by elimination of access and construction of additional grade separations, as specified in the MAG Long Range Transportation Plan.

2.0 MULTIMODAL STUDIES AND PROGRAMS

Thirty-five multimodal and intelligent transportation system documents pertaining to Grand Avenue were reviewed as part of the Grand Avenue MIS. A brief summary of each report follows.

In addition to the reports reviewed below, many federal and state regulations, policies and standards affect transportation planning and project development throughout Arizona. Updates of important federal planning, environmental and ITS (Intelligent Transportation Systems) regulations are pending as of November 2000. ADOT policies on issues such as noise and emissions control during construction affect all major projects on state highways, including Grand Avenue. The ADOT noise policy was updated during 2000.

Arizona Rail Passenger Feasibility Study Final Report, Kimley-Horn & Associates, Inc., November 1993.

This study concluded that new rail passenger service is feasible in a limited number of Arizona locations, including two involving the Grand Avenue Corridor: a Glendale-Mesa commuter rail line and a Phoenix-Grand Canyon tourist rail line. Both would use the existing BNSF rail corridor along Grand Avenue between I-17 and Loop 101.

Arizona Rail Passenger Feasibility Continuation Study Project Planning, Kimley-Horn & Associates, Inc., June 1994.

This study documented the detailed project planning of key recommendations resulting from the *Arizona Rail Passenger Feasibility Study*. These recommendations included further consideration of a 33-mile commuter rail corridor between 82nd Avenue/Peoria Avenue in Peoria and Baseline Road in Mesa, of which roughly 12 miles are along Grand Avenue. The study developed capital and operating cost estimates, revenue projections, and potential locations for route termini and other stations. Grand Avenue northwest of Downtown Peoria was not among the corridors recommended for further consideration, primarily because of low ridership projections for commuter service in the Sun Cities area.

FY 1994 State Rail Plan Update Final Report, Parsons Brinckerhoff Quade & Douglas (for ADOT), June 1994.

This update to the Arizona State Rail Plan provides information on the systems, projects and activities of Arizona's passenger and freight railroads, including the Class 1 BNSF (at that time, AT&SF) route within the Grand Avenue Corridor.

High Occupancy Vehicle Facilities Policy Guidelines and Plan for the MAG Freeway System, Final Report & Executive Summary, Lima & Associates and JHK & Associates, September 1994.

The HOV Policy Guidelines and Plan for the MAG region was a joint undertaking of ADOT, MAG and the Regional Public Transportation Authority (RPTA). A park-and-ride lot was proposed for Grand Avenue (at that time still designated as the future Grand Expressway) near El Mirage Road. No HOV lanes were recommended northwest of Loop 101, however.

Draft Fiscal Year 1995 MAG Transportation Management Systems Report, MAG, November 1994.

This is a progress report on the development and application of six regional management systems: Congestion, Intermodal, Pavement, Safety, Bridge and Public Transportation. The report identifies several problem areas within the Grand Avenue Corridor, including eight intersections projected to experience serious congestion by 2015. Specific findings included:

- Eight intersections in the study corridor, including four in Sun City and three in Surprise, will be seriously congested by 2015.
- Dysart Road from Grand Avenue to Greenway Road, plus two local street segments in Youngtown, have pavement with poor ratings.
- One bridge on Grand Avenue west of Litchfield Road fails to meet applicable design standards.

Arizona State Transportation Plan, ADOT, December 1994.

This multimodal transportation plan classifies Grand Avenue within the study corridor as a Principal Arterial—Other. As US 60, Grand Avenue is on the National Highway System and has been designated as a National Intercity Truck Route. Grand Avenue is also part of a “Transportation Corridor of Statewide Significance.”

1993 Study of Travel Speed and Delay in the MAG Region, Lee Engineering, March 1995.

The study documents the collection and analysis of travel speed data within the MAG region. The report also presents intersection stopped delay data at signalized intersections. Data on travel speeds for Grand Avenue and HOV facilities are included in the report.

MAG Intermodal Management System, April 1995.

This document identifies intermodal transportation facilities in the MAG region, identifies deficiencies and lists potential projects. Intermodal facilities in the Grand Avenue Corridor include the BNSF’s El Mirage

Auto Distribution Facility and the Greyhound stop in Youngtown. Grand Avenue, Loop 101 and Loop 303 serve as intermodal access routes for the region. No problems were identified at the El Mirage Auto Distribution Facility, but the report noted that Grand Avenue has inadequate pavement and that the Grand/R.H. Johnson intersection is congested.

MAG Pedestrian Area Policies and Design Guidelines, Logan Simpson & Dye, October 1995.

These policies and guidelines are intended to promote a safe and comfortable environment for pedestrians at the neighborhood, community, district and campus levels. Many examples are illustrated for different types of land uses and activity areas.

Express Bus Study Background Report, City of Phoenix and Regional Public Transportation Authority, September 1996.

This report provides information on regional express bus services, ridership patterns, user attitudes and related issues as background for development of a regional express bus system plan.

Bikeways in the Metropolitan Phoenix Area, MAG, 1997.

This regional map illustrates regional bikeway facilities including multi-use paths (paved and unpaved), bicycle lanes, signed bicycle routes and edge stripes. A revised version is expected to be ready by early 2001. Bike lanes exist on El Mirage Road from Santa Fe Lane to Thunderbird Road, and there is a paved multi-use path along 111th Avenue from Grand Avenue to Peoria Avenue.

Rural Maricopa County Transit Development Program, TransitPlus, Inc., February 1997.

This study, prepared for the Maricopa County Department of Transportation (MCDOT), considered alternatives for improving public transportation in rural Maricopa County within available resource constraints. Recommended improvements include a route-deviation service between Wickenburg and the metro area operating two to three times per week, and expansion of fixed-route and route-deviation services in the Sun Cities.

Maricopa County 2020 Eye to the Future Transportation System Plan, December 1997.

The plan presents a comprehensive, regional vision for the MCDOT, which is responsible for public roads throughout unincorporated areas of the county. Elements of this plan include policies, roadways, transit, non-motorized modes and Intelligent Transportation Systems (ITS). The ITS chapter describes the AZTech Model Deployment Initiative, a 1995 Maricopa County project that used a federal ITS Early Deployment

Planning Grant to develop a regional ITS Strategic Plan. The MAG Regional Council adopted this plan in 1996. The AZTech Initiative designated Grand Avenue from Van Buren Street to Bell Road as one of the eight original “SMART Corridors” for enhanced traffic detection, data collection, and signal control. (See also the discussion below of the MAG ITS Strategic Plan Update.)

The Transportation System Plan shows all of Grand Avenue as a “primary road” serving regional travel. As defined by MCDOT, criteria for inclusion in the unofficial primary roadway system include regional emphasis, system requirements (upgradability, connectivity, continuity, principal routes to freeway system), access to activity centers and scenic/recreational significance. The Transportation System Plan also shows Grand Avenue with an “on-road bikeway overlay,” a “potential bus routes overlay” southeast of Meeker Boulevard, and an “ITS SMART Corridors overlay” southeast of Bell Road. Several other roads in Sun City and Sun City West are potential routes for local circulator buses.

The other County-designated primary roads in the study area are Loop 303, Bell Road and Dysart Road from Bell Road south. Bell Road has a bikeway overlay, a SMART Corridors overlay east of Grand and a potential bus route overlay east of Litchfield Road.

Estrella Corridor Study MC 85 to Interstate 17, DeLeuw Cather & Company, March 1998.

This study, conducted for MCDOT, evaluated alternatives for the preservation and future development of the 37-mile Estrella (Loop 303) Corridor. These alternatives relate specifically to the routing of the highway from Lake Pleasant Road to I-17. Between MC 85 and Lake Pleasant Road, a six-lane, at-grade expressway with a 65 mph design speed is proposed as the ultimate facility.

Grand Avenue Corridor Study, URS Greiner, May 1998.

This study (see Section 1.0 above) considered a wide range of improvement options for Grand Avenue from 7th Avenue to Cotton Lane, and recommended three alternatives for further evaluation. It briefly examined ways in which light rail and express bus transit could be integrated with proposed highway improvements in the corridor.

Bicycle Transportation System Plan, MCDOT, January 1999 (Final Draft).

This plan for the unincorporated areas of Maricopa County contains a list of over 100 recommended bikeways, including three (two in Sun City and one in the Loop 303 corridor) that lie partially within the Grand Avenue Corridor. Specifically, on-street bikeways are recommended for Loop 303 from Grand to 107th Avenue, 99th Avenue from Olive Avenue to Bell Road, and 103rd Avenue from Grand to Boswell Boulevard.

MAG Regional Bicycle Plan, revised January 1999.

The MAG Regional Bicycle Plan sets bicycle planning objectives and recommends a regional bikeway system. The plan calls for on-road bikeways along Grand Avenue, Bell Road, 99th Avenue and Litchfield Road south of Bell. Off-road bikeways in the New and Agua Fria river corridors are also proposed.

MCDOT Accomplishments and Five-Year Transportation Improvements Program for Fiscal Years 2000-2004, June 1999.

This document serves as the MCDOT's five-year roadway construction program. Two of the programmed projects lie within the Grand Avenue study corridor. These are construction of the Loop 303/Grand Avenue interchange, and extension of Loop 303 from Grand Avenue to Lake Pleasant Road.

Long Range Transit Plan, Regional Public Transportation Authority, June 1999.

This document provides long-range planning guidelines for fixed guideway, local bus, express bus, neighborhood circulator and paratransit services. The plan calls for an overall tripling of transit service in the greater Phoenix area, with buses operating 19 hours per day on weekdays and 14 hours on weekends. Buses would run at least every 30 minutes throughout the day on all major streets, with additional service during peak hours. Paratransit (dial-a-ride) would be improved to an equivalent level. There are currently no funding sources to implement these services in the northwest Valley or the Grand Avenue Corridor, however. (See below under "Short Range Transit Report" for specific transit services proposed for short-term implementation in the corridor.)

Grand Avenue Major Investment Study, URS Greiner Woodward Clyde, September 1999.

In addition to developing a recommended alternative for major roadway improvements, the MIS addressed the implications of these improvements for transit, bicycles and pedestrians. Among the concepts considered were bike paths within the right-of-way, high-frequency express bus service, reserved HOV/bus lanes, and extension of a future light rail line from Downtown Glendale to Downtown Peoria via the Grand Avenue Corridor. Light rail was found to be a feasible concept for further study, while HOV lanes were rejected because of inefficiency and operational concerns. (See also Section 1.0.)

MAG Pedestrian Plan 2000, The Planning Center and SCI, December 1999.

This document provides a review of existing conditions, goals and objectives, analysis of potential pedestrian trip activity using the latent demand model, roadside facility performance guidelines (design criteria) and an action plan for the MAG region. Several areas of pedestrian demand or potential activity were identified in Sun City, Sun City West, Youngtown and El Mirage.

MCDOT Northwest Valley Transportation Study, BRW, Inc., June 2000.

The Northwest Valley Transportation Study includes the entire Grand Avenue study corridor. The study developed a long-range transportation plan for all modes, including transit, bicycles and pedestrians. Official MAG networks and socioeconomic data were used to forecast traffic for the years 2003 and 2010. MCDOT developed two sets of traffic forecasts for 2020. The first was based on the MAG model inputs, while a “sensitivity” analysis incorporated additional growth expected by the cities of Peoria and Surprise. Recommendations of the study included several future capacity increases on various segments of Grand to meet forecasted demand, plus expanded transit service in the corridor. This study has not been adopted as part of the MAG Long Range Transportation Plan.

Specific recommendations of the Northwest Valley Transportation Study include:

- By 2003, widen Grand to eight lanes from 91st to 99th Ave, and to six lanes from 107th to Greenway.
- By 2010, widen Grand to eight lanes from 99th to Thunderbird, and to 6 lanes from Greenway to Loop 303.
- By 2020 (under the MAG development scenario), widen Grand to eight lanes from Thunderbird to Greenway.
- By 2020 (under the sensitivity scenario), widen Grand to eight lanes from Greenway to Loop 303.
- Extend bus service on Grand to Bell Rd by 2003 and to Meeker Blvd by 2008.

5-Year Highway Construction Program FY 2001-2005, ADOT, June 2000.

This annually updated document lists all projects scheduled for construction on the Arizona state highway system.

MAG Long-Range Transportation Plan Summary and 2000 Update, July 2000.

This document summarizes the long-range, multimodal transportation plan for the MAG region. The plan’s horizon year is 2020. The freeway/expressway element states that “a corridor study to identify ultimate and near term concepts for the portion of Grand Avenue between the Agua Fria Freeway and the Beardsley Canal is underway.” In addition, the Plan calls for the portion of Grand between Loop 101 and I-17 to be upgraded to expressway standards by elimination of access and construction of additional grade separations, beyond those recommended for short-term construction in the 1999 Major Investment Study. The Express Bus Plan map shows a future express bus route on Grand Avenue from Loop 101 to Bell Road, with park-and-ride lots at Bell Road and at Loop 101.

Short Range Transit Report Fiscal Year 2000 through 2004, Valley Metro, no date.

The Short Range Transit Report summarizes existing transit facilities and operations. It also documents planned capital and operating improvements to the regional transit system for a five-year period. Listed projects affecting the Grand Avenue Corridor include the purchase of capital equipment and facilities, as well as several planned but unfunded transit service improvements. Programmed capital projects include RPTA's purchase of 14 replacement buses and one bus to expand service for Sun Cities Area Transit, as well as the design and/or construction of five regional park-and-ride lots throughout the Phoenix metropolitan area. Planned (but currently unfunded) operating improvements consist of new fixed-route bus service on Dysart Road, extension of the existing Thunderbird Road route west to Boswell Hospital, extension of the Bell Road route west to Dysart Road, and a "Wickenburg Connector" offering deviated fixed-route service between Wickenburg and key destinations in the greater Phoenix area.

Transportation Improvement Program FY 2001-2005, MAG, July 2000.

This multimodal five-year program provides information on all programmed transportation projects throughout the MAG region, including state, county and local improvements to roadway and transit systems.

Bus Book, Valley Metro, August 2000.

The Bus Book includes route maps and schedules for all local and express bus routes in the greater Phoenix area.

Regional Dial-a-Ride Guide, Valley Metro, no date.

This publication provides information on the Valley's 10 Dial-a-Ride services, including Sun Cities Area Transit and the El Mirage and Surprise Dial-a-Rides.

"Trails Master Plan," City of Peoria, no date.

This document is a map illustrating planned on-street bike routes, paved multi-use paths, unpaved multi-use trails and equestrian trails in Peoria.

MAG ITS Strategic Plan Update, Kimley-Horn & Associates, in progress.

MAG is currently engaged in a 12-month study to produce a detailed plan for deploying Intelligent Transportation System (ITS) projects and programs throughout the region over the next 20 years. This update, scheduled for completion in March 2001, will revise the original ITS Strategic Plan completed in

1995 as part of the AZTech Model Deployment Initiative, a federally funded demonstration project involving Maricopa County and other MAG member agencies. Key elements to be identified or developed during the Update include:

- ITS solutions to be deployed over the next 20 years to meet regional transportation needs.
- A System Architecture to show how all of the systems, subsystems and field elements work together.
- A Telecommunications Plan to support the candidate technologies (many of which are already in place on key freeways and arterial roadways).
- An Implementation Plan for short-, medium- and long-range ITS deployment.
- Operational and Implementation Strategies to outline agency roles, responsibilities and resources needed to support long-term ITS operations.

Grand Avenue from Van Buren Street to Bell Road was previously identified in the AZTech Model Deployment Initiative as one of 24 regional SMART corridors. These corridors are key arterial links that pass through multiple jurisdictions. ITS technologies to be implemented in SMART corridors include traffic detection, closed circuit television cameras and variable message signs. Traffic signals are coordinated across jurisdictional boundaries and freeway interchange signals are coordinated with arterial street signal systems. Grand Avenue between Loop 101 and Bell Road, as well as the portion southeast of the study area, is a Phase I corridor, meaning that ITS implementation has begun. Bell Road to the east of Grand Avenue is also a Phase I ITS corridor.

Nine technical memoranda prepared during the course of the project will culminate in a Final Report and Executive Summary. Technical Memorandum #6B, ITS Implementation Plan, identifies the following planned projects that are likely to affect the study corridor:

- Install Freeway Management System (FMS) components on Loop 101, Grand Ave to I-17 (mid-term project, 2007-2011).
- Upgrade components on existing SMART corridors and add additional components as needed (long-term project, 2012-2021).
- Improve signal coordination along SMART corridors (long-term project, 2012-2021).

MAG Park-and-Ride Lot Site Selection, KJS Associates, in progress.

The purpose of this project is to select sites for park-and-ride lots throughout the greater Phoenix area, and to develop an implementation and funding program for developing the lots and related facilities. The project is scheduled for completion in mid-2001, with the draft report due in January. As of November 2000, analyses of thirty-two general target areas for the lots have been completed, and site analyses for short-listed target areas are underway. One short-listed target area and a portion of another are located within the study area of this project (from Loop 101 to Loop 303). Design criteria have been developed for the park-and-ride lots as part of the site selection project. *(To be updated in early 2001.)*

MAG-ADOT CANAMEX Corridor Study, in progress.

The purpose of this study is to identify a route through the MAG region for the CANAMEX Corridor, a north-south highway route for tourism, trade and freight transportation between Mexico, the United States and Canada. The other links in this key trade route have already been selected.

A Stakeholders' Forum in November 1999 short-listed eight alternatives, involving three southern routes (I-8, I-10 and Riggs Road) and three northern routes (Loop 303, Sun Valley Parkway and Wickenburg Road/Vulture Mine Road). A draft MAG-ADOT joint recommendation has been developed and is undergoing the approval process, starting with the MAG committees in October-November 2000. The recommendation is for the future designation of I-8 (from I-10 to SR 85), SR 85 (from I-8 to I-10), I-10, US 60 southeast of Wickenburg, and the proposed Wickenburg Bypass. The north-south connection from I-10 to US 60 remains undefined at this time.

Further study is needed to identify a route for the corridor from the SR 85/I-10 junction to the Wickenburg Bypass, based on the comments received during agency, public and other stakeholder consultation in August and September 2000. The remaining alternatives for this connection are Maricopa County facilities. The additional study will consider findings and recommendations from related studies that are scheduled for completion in 2001 or shortly thereafter, including the multi-state CANAMEX Corridor Study and the Maricopa County Transportation System Plan Update. A final report from ADOT with a recommendation for the Wickenburg Bypass is also not expected for approximately a year. *(To be updated in early 2001.)*

Grand Avenue Image Improvement Study, A DYE DESIGN (for City of Glendale), in progress.

This study is considering ways to improve the attractiveness and overall image of the five-mile segment of Grand Avenue in the city of Glendale, from 43rd to 71st Avenue. Examples of proposed enhancements include landscaping and bus stop treatments. Draft findings are expected toward the end of January 2001.

Pedestrian-Oriented Development Guidelines, Regional Public Transportation Authority, in progress.

Based on the principles of transit-oriented development, but with a broader focus on the pedestrian, these guidelines are being prepared by the RPTA to provide planners and developers with tools for more pedestrian-oriented development. Currently in draft form, these guidelines will be the subject of a design competition to be sponsored later this year by Valley Forward. The competition will draw on the talents of local designers and developers to demonstrate the application of pedestrian principles in the desert environment. Valley Forward will work with participating cities to promote the approval of future plans that are in keeping with the spirit of the winning entries.

Regional Transportation Plan, MAG, in progress.

This project will develop a comprehensive, multimodal regional transportation plan through the year 2025, in two phases. The first phase will begin toward the end of 2000 and is expected to last one year. It will include issue papers, expert panel forums, a state of the region report, development of alternative growth concepts and transportation options, analysis of alternatives, and development of policies and strategies. These activities will lay the groundwork for the second phase, preparation of the detailed long-range transportation plan.

3.0 LAND USE AND COMMUNITY PLANS

The planning and economic development departments of the Cities of Peoria, El Mirage and Surprise were contacted to obtain documents presenting land use and socio-economic conditions within the Grand Avenue corridor. (Youngtown has only a map of current zoning.) The following land use and community plans were reviewed and documented for the Grand Avenue Northwest Corridor Study.

El Mirage General Plan, 1986.

This document is now nearly 15 years old and is considered obsolete by El Mirage city staff. An updated version is expected in the near future.

Phoenix Area Economic Base Study: Maricopa County, AZ, Data Report, December 1996.

The study provided general statistical information for the municipalities within Maricopa County. This information was presented in the form of industry sector summaries and area-wide demographic/economic data.

Peoria Comprehensive Master Plan (Volume II), April 1997.

The Master Plan identified general land use for the Grand Avenue corridor within the city boundaries. The Comprehensive Master Plan displayed the land use adjacent to Grand Avenue as primarily industrial, business park and community commercial. Land use in the downtown area, immediately adjacent to Grand Avenue, is primarily high-intensity community commercial. A major update of the Comprehensive Master Plan is currently underway.

Peoria Downtown Redevelopment Plan, Design Workshop, 1999.

The Plan defines redevelopment and economic development initiatives and strategies for the downtown area, with emphasis on preserving the existing commercial inventory and establishing community identity and promoting a pedestrian oriented environment.

Surprise General Plan 2020, Partners for Strategic Action, September 2000 (Public Hearing Review Draft, with recommended changes from City Council and Planning & Zoning Commission).

Transportation-related recommendations for the Grand Avenue study area include the following:

- Loop 303 (south of Grand) is proposed as a four- to six-lane parkway emphasizing landscaping, meandering sidewalks and a regional bikeway connection.

- Grand Avenue is shown as a principal arterial, with a pedestrian overpass recommended in the vicinity of Sunny Lane.
- Transit routes are recommended for Grand Avenue (from Jomax Road to El Mirage) and several intersecting roads such as Greenway, Dysart, Bell, Reems and Loop 303. Proposed park-and-ride locations include Bell Road between El Mirage and Dysart, Bell Road between Litchfield and Bullard, and Grand Avenue just northwest of Loop 303.
- Proposed bicycle and multimodal routes include a multi-use path parallel to Grand Avenue, as well as bike lanes on Greenway, Dysart, Reems and Mountain View Boulevard. The Agua Fria River is a proposed West Valley Recreation Corridor.
- “Upon completion of the Grand Avenue expansion, access to the facility should be minimized. The portions of Grand Avenue that have not been developed should be encouraged to maintain a one-mile spacing of all access points.” The same one-mile spacing is recommended for access to Loop 303.

4.0 CULTURAL RESOURCE DOCUMENTS

In conjunction with the 1999 Grand Avenue MIS, a literature search at the State Historic Preservation Office Library was performed to obtain documents on cultural resources. Two documents that pertain to Grand Avenue from Loop 101 to Loop 303 were found. Brief reviews of these documents are provided below, along with references to other sources of information on historically significant sites.

Grand Avenue Corridor Study, Cultural Resource Survey, Janus Associates, Inc., June 1986.

The survey resulted in the identification and evaluation of 49 historic properties of varying eligibility on the National Register. The report also provided a historic account of the development of Grand Avenue.

Grand Avenue Alignment Historic Building Survey, Woodward Architects, February 1993.

The survey identified 116 buildings built prior to 1942. The report provided an inventory and index map for each of the properties.

National Register of Historic Places.

The National Register of Historic Places was established by the National Historic Preservation Act of 1966, as amended in 1980. It is the nation's official listing of prehistoric and historic properties worthy of preservation. It affords recognition and protection for districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, engineering and culture. The Register serves as a planning tool and as a means of identifying sites and districts that are of special significance to a community and worthy of preservation. A review of the National Register Information System found no listings within the Grand Avenue Northwest Corridor.

Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER) Collections.

The HABS and HAER are collections of documentary measured drawings, photographs, and written historical and architectural information for over 31,000 structures and sites in the United States. The U.S. Department of the Interior administers the surveys and creates the records, which are transferred to the Library of Congress. Architectural and engineering structures and sites of almost every type, including residential, commercial, public, religious, military, and industrial categories, have been recorded in these collections. A review of the on-line geographic index found no listings within the Grand Avenue Northwest Corridor.

5.0 SUMMARY

Table 1 summarizes relevant conclusions and recommendations from the more recent studies and plans listed in preceding sections. Not all of these documents are included in the table, since not all contain specific findings or recommendations regarding Grand Avenue from Loop 101 to Loop 303.

TABLE 1
RELEVANT CONCLUSIONS AND RECOMMENDATIONS FROM RECENT STUDIES

| Study or Plan | Conclusions and Recommendations |
|---------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Arizona Rail Passenger Feasibility Continuation Study</i> (1994) | Grand Ave northwest of Downtown Peoria was not among the corridors recommended for further consideration, primarily because of low ridership projections for commuter service in the Sun Cities area. |
| <i>HOV Facilities Policy Guidelines & Plan</i> (1994) | Develop a park-and-ride lot near Grand/El Mirage Rd. |
| <i>Draft MAG Transportation Systems Management Report</i> (1994) | <ul style="list-style-type: none"> ▪ Eight intersections, including four in Sun City and three in Surprise, will be seriously congested by 2015. ▪ Dysart from Grand to Greenway and two local street segments in Youngtown have pavement with poor ratings. ▪ One bridge on Grand west of Litchfield is substandard. |
| <i>MAG Intermodal Management System</i> (1995) | <ul style="list-style-type: none"> ▪ Grand Avenue has inadequate pavement. ▪ The Grand/R.H. Johnson intersection is congested. ▪ No problems noted at El Mirage Auto Distribution Facility. |
| <i>US 60 Final DCR, Morristown-Beardsley Rd</i> (1996) | Construct four-lane divided highway with a 60-foot median, using existing roadway for westbound traffic. |
| <i>Bikeways in the Metropolitan Phoenix Area</i> | There are bike lanes on El Mirage Road from Santa Fe Ln to Thunderbird, and a paved multi-use path along 111 th Ave from Grand to Peoria. |
| <i>Rural Maricopa County Transit Development Program</i> (1997) | <ul style="list-style-type: none"> ▪ Expand fixed-route and route-deviation services in the Sun Cities. ▪ Implement a twice- or thrice-weekly route-deviation service between Wickenburg and the metro area. |
| <i>Maricopa County 2020 Eye to the Future Transportation System Plan</i> (1997) | <ul style="list-style-type: none"> ▪ Grand Avenue is on the County's designated Primary Roadway System. ▪ Southeast of Meeker Blvd, Grand is a potential bus route. ▪ Several other roads in Sun City and Sun City West are potential routes for local circulator buses. ▪ Southeast of Bell Rd, Grand is designated as an ITS Smart Corridor. |

| Study or Plan | Conclusions and Recommendations |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Grand Avenue Corridor Study</i> (1998) | <ul style="list-style-type: none"> Improvement options include: Depressed expressway through Sun City, with frontage roads & ramps connecting to major cross streets. Grade separation for pedestrians & golf carts in Sun City. Improved lane continuity, signal timing & progression between New & Agua Fria rivers. Diversion of traffic west of Sun City to Loop 303, Dysart Road, or a possible new north-south route from Bell to Olive near the Agua Fria River. |
| <i>MCDOT Bicycle Transportation System Plan</i> (1999) | Bikeways are recommended for Loop 303 from Grand to 107 th Ave, 99 th Ave from Olive to Bell, and 103 rd Ave from Grand to Boswell Blvd. |
| <i>MAG Regional Bicycle Plan</i> (1999) | The plan calls for on-road bikeways along Grand Avenue, Bell Road, 99 th Avenue and Litchfield Road (south of Bell). Off-road bikeways in the New and Agua Fria river corridors are also proposed. |
| <i>MAG Long-Range Transportation Plan Summary & Update</i> (2000) | A future express bus route is shown on Grand from Loop 101 to Bell, with park-and-ride lots at Bell and Loop 101. |
| <i>Short Range Transit Report</i> | (The Existing Conditions working paper will list all planned projects.) |
| <i>MCDOT Five-Year Transportation Improvement Program</i> (1999) | Two projects in the study corridor are listed: construction of the Loop 303/Grand interchange, and extension of Loop 303 from Grand to Lake Pleasant Rd. |
| <i>MAG Transportation Improvement Program</i> (2000) | (The Existing Conditions working paper will list all programmed projects.) |
| <i>Grand Avenue Major Investment Study</i> (1999) | Complete the Loop 101 interchange by constructing a southbound off-ramp and a northbound on-ramp connecting with 91 st Avenue. |
| <i>Northwest Valley Transportation Study</i> (2000) | <ul style="list-style-type: none"> By 2003, widen Grand to eight lanes from 91st to 99th Ave, and to six lanes from 107th to Greenway. By 2010, widen Grand to eight lanes from 99th to Thunderbird, and to 6 lanes from Greenway to Loop 303. By 2020 (under the MAG development scenario), widen Grand to eight lanes from Thunderbird to Greenway. By 2020 (under the sensitivity scenario), widen Grand to eight lanes from Greenway to Loop 303. Extend bus service on Grand to Bell Rd by 2003 and to Meeker Blvd by 2008. |
| <i>ADOT 5-Year Construction Program</i> (2000) | (The Existing Conditions working paper will list all programmed projects.) |

| Study or Plan | Conclusions and Recommendations |
|-----------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Surprise General Plan 2020 (2000)</i> | <ul style="list-style-type: none"> ▪ Grand Avenue is shown as a principal arterial, with a pedestrian overpass recommended in the vicinity of Sunny Lane. ▪ Transit routes are recommended for Grand Avenue (from Jomax Road to El Mirage) and several intersecting roads such as Greenway, Dysart, Bell, Reems and Loop 303. Proposed park-and-ride locations include Bell Road between El Mirage and Dysart, Bell Road between Litchfield and Bullard, and Grand Avenue just northwest of Loop 303. ▪ Proposed bicycle and multimodal routes include a multi-use path parallel to Grand Avenue, as well as bike lanes on Greenway, Dysart, Reems and Mountain View Boulevard. The Agua Fria River is a proposed West Valley Recreation Corridor. ▪ “Upon completion of the Grand Avenue expansion, access to the facility should be minimized. The portions of Grand Avenue that have not been developed should be encouraged to maintain a one-mile spacing of all access points.” |
| <i>MAG Park-&-Ride Site Selection (ongoing)</i> | One short-listed target area and a portion of another are located within the Grand Avenue Northwest study corridor. |
| <i>CANAMEX Corridor Study (ongoing)</i> | The tentatively recommended route (as of fall 2000) uses I-8, SR 85, I-10, US 60 and the proposed Wickenburg Bypass to US 93. The connection from I-10 to US 60 remains undefined at this time (January 2001). |

Source: BRW, Inc., January 2001.